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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,322	12/12/2003	Raymond K. Orr	79115-31 /pw	9103
<div>7590 SMART &amp; BIGGAR 900-55 Metcalfe Street P.O. Box 2999, Station D Ottawa, ON K1P 5Y6 CANADA</div>			<div>EXAMINER ODOM, CURTIS B</div>	
			<div>ART UNIT 2611</div>	<div>PAPER NUMBER</div>
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	01/24/2007	PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/733,322	<b>Applicant(s)</b> ORR ET AL.	
	<b>Examiner</b> Curtis B. Odom	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are cooperative relationships between the clock signal and the apparatus for determining a modulation parameter (see claim 1). Without these structural relationships, the examiner cannot distinctly point out what the applicants regards as his invention.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Jou et al. (U. S. Patent No. 6, 181, 123).

Regarding claim 1, Jou et al. discloses pulse modulation arrangement (see Fig. 2) comprising a clock signal generated by a digitally controlled oscillator (see Fig. 2, block 100) for determining a desired frequency (see column 4, lines 50-57) of a pulse modulation signal and apparatus for determining a modulation parameter (duty cycle and frequency) of the pulse modulation signal (see column 6, lines 55-60), the apparatus for determining a modulation parameter of the pulse modulation signal comprising a frequency controlled source (digitally controlled oscillator, see Fig. 2, block 100) responsive to a digital frequency/pulse modulation control signal (F\_WORD) as described in column 4, lines 50-61).

Regarding claim 2, Jou et al. discloses the apparatus for determining a modulation parameter of the pulse modulation signal further comprises a counter (see Fig. 1B, block 26, column 2, lines 7-22) for counting pulses of the clocking signals produced by the oscillator.

Regarding claim 3, Jou et al. discloses the counter is controllable using a duty cycle control signal (see Fig. 1B, column 2, lines 7-22) for counting a controlled number of pulses produced by the oscillator for determining the modulation parameter (different duty cycles) of the pulse modulation signal.

Regarding claim 4, Jou et al. discloses the pulse modulation control signal comprises a digital control signal (F\_WORD), see column 4, lines 50-61.

Regarding claim 5, Jou et al. discloses the digital oscillator comprises a plurality of delay cells comprising binary weighted elements (see column 4, lines 50-60) and a plurality of switches (transistors) for selecting the binary weighted elements (delay cells) in dependence upon respective bits of the digital control signal (see column 5, lines 13-20).

Regarding claim 6, Jou et al. discloses the binary weighted elements (delay cells) are loaded with current (see column 6, lines 25-29 and lines 65-67).

Regarding claim 7, Jou et al. discloses the binary weighted elements (delay cells) comprise capacitors (see column 5, lines 5-12).

Regarding claim 8, Jou et al. discloses the binary weighted elements comprise delay elements (see column 4, lines 50-61)..

Regarding claim 9, Jou et al. discloses the pulse modulation control signal comprises a digital control signal (F\_WORD), see column 4, lines 50-61.

Regarding claim 10, Jou et al. discloses the digital oscillator comprises a plurality of delay cells comprising binary weighted elements (see column 4, lines 50-60) and a plurality of switches (transistors) for selecting the binary weighted elements (delay cells) in dependence upon respective bits of the digital control signal (see column 5, lines 13-20).

Regarding claim 11, Jou et al. discloses the binary weighted elements (delay cells) are loaded with current (see column 6, lines 25-29 and lines 65-67).

Regarding claim 12, Jou et al. discloses the binary weighted elements (delay cells) comprise capacitors (see column 5, lines 5-12).

Regarding claim 13, Jou et al. discloses the binary weighted elements comprise delay elements (see column 4, lines 50-61).

Regarding claim 14, Jou et al. discloses the digital oscillator comprises a match loading current source (see column 5, lines 46-47) for providing a current (see column 6, lines 25-29 and lines 65-67) with a controlled (changed) magnitude than does not affect output voltage (see column 6, lines 25-29).

Regarding claim 15, Jou et al. discloses the modulation parameter comprises a pulse width (duty cycle) of the pulse modulation signal (see column 4, lines 22-25).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jou et al. (U. S. Patent No. 6, 181, 123) as applied to claim 1, in view of Chapuls (U. S. Patent No. 6, 833, 691).

Regarding claim 16, Jou et al. does not disclose the modulation parameter comprises a phase shift of the pulse modulation signal.

However, Chapuls also discloses a pulse modulation circuit, wherein the phase shift of the pulse modulation signal can be controlled by a digital pulse modulation control signal (PHASE SIGNAL), see column 8, lines 6-25. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to also implement control of the phase of the pulse modulation signal of Jou et al. as disclosed by Chapuls in order to control the start of the pulse width modulation signal which is useful when several pulse modulation signals need to be generated phase shifted with respect to each other (see Chapuls, column 7, lines 55-60).

7. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jou et al. (U. S. Patent No. 6, 181, 123) as applied to claim 1; in view of Boros (U. S. Patent No. 4, 095, 165).

Regarding claims 17-20, Jou et al. does not disclose the pulse with modulation circuit comprises a switch mode regulator controlled by the pulse modulation arrangement, wherein a switching clock of the switch mode regulator is derived from the clock signal for determining a frequency of the pulse modulation signal, and the pulse modulation control signal comprises a feedback control signal of the switch mode regulator, wherein the pulse modulation control signal further comprises a feed forward control signal dependent upon an input voltage of the switch mode regulator, wherein the feed forward control signal comprises a digital signal or analog signal.

However, Boros discloses a switching regulator (see Fig. 1 and Fig. 2) for a pulse width modulation signal, wherein controlling switching a of clock (see Fig. 2, block 20) which provides conduction of the regulator (see column 7, lines 11-26) is derived from the oscillator clock signal for determining frequency of a pulse modulation signal (see column 2, lines 36-42), wherein the pulse modulation control signal of the switching regulator comprises feedback control signals (see column 4, lines 40-53), wherein the pulse modulation control signal of the oscillator comprises feed forward control signals from the switching regulator (see column 4, lines 54-62) which are dependent upon a DC input voltage of the regulator (see column 5, lines 56-68), wherein the feed forward control signal applied to the oscillator is an analog voltage signal (see column 4, lines 54-62). However, it would have also been obvious to one skilled in the art at the time the invention was made to implement a digital feed forward control signal with

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a digitally controlled oscillator since Boros states the digital approach advantageously eliminates the analog components which are subject to environmental factors such as temperature changes and aging (see column 2, lines 46-50). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to implement the switching regulator in Jou et al. as disclosed by Boros to create an output signal with a desired regulated value (see column 1, lines 15-34).

### *Conclusion*

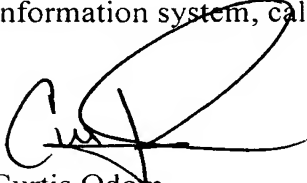
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Curtis Odom', is written over the signature line.

Curtis Odom  
January 22, 2007